LAMPIRAN

1. Instalasi Jaringan Wireless Bridge

Instalasi dan Konfirgurasi TP-LINK TL-WR841ND

Setelah semua *device* terhubung dengan benar antar gedung yaitu antara Gedung A dengan Gedung B sesuai dengan skema rancangan yang telah di buat diatas. Maka dapat langsung melakukan instalasi dan konfigurasi jaringan.

1. Persiapan Instalasi Jaringan pad Gedung

Mempersiapkan semua alat yang dibutuhkan sesuai dengan Prosedurisasi Instalasi *Wireless Bridge* diatas dan mengikuti langkahlangkah tersebut, dilakukan secra bersamaan di setiap gedung, untuk dapat saling berkomunikasi gunakanlah alat Radio HT. Setelah semuanya dilakukan dengan benar lalu melakukan instalasi perangkat radio/access point.

2. Instalasi Access Point pada Gedung A

Langkah-langkah yang dilakukan :

a. Konfirgurasi IP Address

 Mengkonfirgurasi Network Connection pada control panel, lalu double klick connection pada Network Interface Cart (NIC). Lalu akan muncul tampilan berikut, klik Properties.

eneral Support	
Connection	
Status:	Connected
Duration:	00:25:38
Speed:	100.0 Mbps
Activity	Sent — 👘 Received
Packets:	313 291
Properties	Disable

Gambar L.1 Konfirgurasi Network Connection Gedung A

2. Pada tampilan ini, double klick Internet Protocol (TCP/IP)

Connect using:		
Bealtek RTL813	3/810x Family Fast	Configure
This connection uses th	e following items:	
QoS Packet S		<u>^</u>
M R ALGIS Protoco	of (TCP/IP)	.0.3
		V
Install	Uninstall	Properties
Transmission Control wide area network pr across diverse interco	Protocol/Internet Pro otocol that provides onnected networks.	otocol. The default communication
		ected
Show icon in notifica	ition area when conn	

Gambar L.2 Konfirgurasi Internet Protocol (TCP/IP) Gedung A

 Setelah tampilan *Internet Protocol* (TCP/IP) Propertis muncul, lakukan pengalamatan IP yang akan digunakan pada komputer *server* yang berada pada Gedung A. PC IP *address* : 192.168.1.20

PC Subnet mask : 255.255.255.0

′ou can get IP settings assigne his capability. Otherwise, you n∉ he appropriate IP settings.	d automatically if your network supports eed to ask your network administrator fo
Obtain an IP address autor	matically
Ose the following IP addrese of the second seco	\$5:
IP address:	192.168.1.20
Subnet mask:	255 . 255 . 255 . 0
Default gateway:	
 Obtain DNS server address Use the following DNS server 	s automatically ver addresses:
Destand DMC services	10 10 11 1
Freiened Divo server.	

Gambar L.3 Konfirgurasi TCP/IP Properties Gedung A

b. Ubah Setting Access Point default

 Ubah Settingan Access Point default untuk Gedung A menjadi settingan awal konfirgurasi, dengan melakukan log-in pada web-browser, lalu masukan IP address (Default AP : 192.168.1.1) pada address bar di web-browser lalu tekan enter.



Gambar L.4 Log-in Web-Browser Access Point Default

2. Pada tampilan awal akan muncul Status Access Point default.

TL-WR841N - Microsoft	Internet Explorer			2
File Edit Yew Favorites	Taola Help			
Q O .	a 🐔 🔎 Search 5	- Fanntas 🕝 🔗 - 🍡 🖃 - 🛄 🕻	1 3	
Altheat Amp-(1142.168.1.1/			ALC: NO.	e 🗗 🖉 🖓
	IEEE 002.11n	(Draft 2.0) Gouplant Wreless Router with	2x2 MIMO and XS	PAN*
300M Wireless N Router Model No. TL Westing TL Westing	Status		•	Status Help The Status page displays the Routert
Clates -	Firmware Version:	3.9.7 Build 090821 Rel.58159n		status and configuration. All information only
Outlife Series OSS	Hardware Version:	WR841N v5 0000000		LAN - The following parameters apply to port of the Router. You can configure the
Western	LAN		1	Network > LAN page.
DHCP	MAC Address:	00-27-19-52-10-56		MAC Address - The physical ad
· Security	IP Address:	192.168.1.1		 IP Address - The LAN IP address
Perential Centrol Access Centrol Static Reating	Submit Mask:	265 265 265 0		 Subnet Mask - The subne associated with LAN IP address.
Bassiwidth Control	Wireless			Windows - These are the current set
 Dynamic DHS 	Wreless Radio:	Enable		information for Wireless You can configu
System Teels	Nome (SSID):	Cube_Network		and a summer of summer second s in
	Channet	11		 Wireless Radio - Indicatos who wireless radio feature of the R
	Mode:	11bgn mixed		enabled or disabled.
	Channel Width:	Automatic		Channel - The current wireless
	Max Tx Flate:	300Mbps		in use
	MAC Address:	00-27-19-62-10-56		Beller works on Channel Watth - The bandwidth
Done				Dirternet.

Gambar L.5 Status Access Point Default

3. Setelah muncul tampilan awal *access point*, klik menu setup maka akan muncul menu *password* dan *username default access point* yaitu:

Username	: admin	
Password	: admin	
Connect to 192	2.168.1.1	? 🔀
TP-LINK Wireless	N Router WR841N	
User name:	😰 admin	~
Password:	••••	
	Remember my passwo	ord
	ОК	Cancel

Gambar L.6 Login Default Access Point

 Pada tampilan setup masukan *ip address* yang telah direncanakan untuk Gedung A setelah itu tekan *apply setting*.

IP Address	: 192.168.1.2
Subnet mask	: 255.255.255.0

File Edit View Favorites	Tools Help		
Aug. (0. 1)	a 🔥 Orma 🔸		
	No Con Secondary		
Address 🛃 hetp://192.168.1.2/			¥ 🗲 🛛
TP-LINK The Reliable Choice	IEEE 802.11n (Draft 2.0) Compliant Wireless Router with 2x2 MIM	D and XSPAN*
300M Wireless N Router	WAN		WAN Help WAN Connection Type:
Status Outck Setup	WAN Connection Type:	Static IP w Detect	If your ISP is running a DHCP server, set Dynamic IP option.
• OSS - Network	IP Address:	192.168.1.2	If your ISP provides a static or fixed IP Ac Subnet Mask, Gatway and DNS setting
• LAN	Subnet Mask:	255.255.255.0	the Static IP option.
MAC Close Weeless	Default Gateway:	0.0.0.0 (Optional)	If your ISP provides a PPPoE connection, PPPoE option.
Enco Forwarding Security	MTU Size (in bytes);	The default is 1500, do not change unless neo	(#35377) If your KSP provides BigPond Cable (or Beat Signal) connection, please select Bi
Parental Control Access Control	Primary DNS:	0.0.0.0 (Optional)	Cable option
Static Routing Bandwidth Control	Secondary DNS:	(0.0.0.0 (Optional)	selectL2TP option
Dynamic DNS		Seve	If your ISP provides PPTP connection, select PPTP option.

Gambar L.7 Setting IP Address Access Point Gedung A

5. Setelah merubah *ip address deafult* dan *subnet mask default* access point menjadi *ip address* dan subnet mask yang sudah direncanakan untuk Gedung A, tekan menu wireless untuk merubah *Network mode*, SSID dan *channel* yang sudah ditentukan untuk gedung server itu tekan apply *settings*.

SSID	: Gedung A
Channel	: 9-40 MHz
Network mode	: 11 bgn mixed



Gambar L.8 Wireless SSID dan Channel

 Bila ingin merubah username dan password, klik menu System Tools dan masukan username dan password baru yang diinginkan lalu tekan apply setting.

TL-WR841N - Microsof	t Internet Explorer		
File Edit View Favorites	Tools Help		
(3 Back · () ·)	🗟 🐔 🔎 Search 👷	avortes 🚱 🎧 · 🔜 🗑	8.48
Address (interp.) 192-160-1-2			
The Reliable Choice	IEEE 802.11n (D	all 2.0) Compliant Wireless Router with	h 2x2 MIMO and XSPAN™
300M			Password Help
Wireless N Router	Password		r assword help
Model No . TE-WR641N/TE-WR641ND			It is strongly recommended that you
A Status			Router All users who try to access t
Oukk Selup	Old Hoor Name	adada	web-based utility will be prompted for t
• 055	Old Oser Hame.	eomin	user name and password.
Network	Old Password:		Note: The new user name and pass
DHCP			include any spaces. Enter the new
 Forwarding 	New User Name;	Colo	twice to confirm it
 Security 	New Password:		Circle the Save further when finished
Parental Control Account Control	Configuration Descent		Citer and Citer Datas Herein Herein
 Static Routing 	Confirm New Password:		Click the Clear Allbutton to clear all.
Dandwidth Control			
P & MAC Binding		Save Clear All	
System Tools			
Time Settings			
Diagnostic			

Gambar L.9 Settingan Username dan Password Access Point

3. Instalasi Access Point pada Gedung B

Langkah-langkah yang dilakukan :

a. Konfirgurasi IP Address

 Mengkonfirgurasi Network Connection pada control panel, lalu double klick connection pada Network Interface Cart (NIC). Lalu akan muncul tampilan berikut, klik Properties.

ieneral Suppo	rt	
- Connection -		
Status:		Connected
Duration:		00:25:38
Speed:		100.0 Mbps
Activity	Sent — 👖	Received
Packets:	313	291
Properties	Disable	

Gambar L.10 Konfirgurasi Network Connection Gedung B

2. Pada tampilan ini, double klick Internet Protocol (TCP/IP)

C	Authenticatic	in Advanced	
F F	a using. Realtek RTL81	39/810x Family Fast	Configure
This co	nnection uses	the following items:	
	QoS Packet AEGIS Proto	Scheduler col (IEEE 802.1x) v3.2.	0.3
8 2	Internet Prot	ocol (TCP/IP)	
<		Ш	
	nstall	Uninstall	Properties
Descr Tran wide acros	ription smission Contr area network ss diverse inter	ol Protocol/Internet Pro protocol that provides o rconnected networks.	tocol. The default communication
🗹 Sho 🔽 Noti	w icon in notifi fy me when thi	cation area when conn s connection has limiter	ected d or no connectivity

Gambar L.11 Konfirgurasi Internet Protocol (TCP/IP) Gedung B

 Setelah tampilan *Internet Protocol* (TCP/IP) Propertis muncul, lakukan pengalamatan IP yang akan digunakan pada komputer *server* yang berada pada Gedung B.

PC IP address : 192.168.1.30 PC Subnet mask : 255.255.255.0

roeral You can get IP settings assign his capability. Otherwise, you he appropriate IP settings.	ed automatically if your network supports need to ask your network administrator for
Obtain an IP address aut	omatically
- 📀 Use the following IP addr	ess:
IP address:	192.168.1.30
Subnet mask:	255 . 255 . 255 . 0
Default gateway:	
 Obtain DNS server addre Obtain DNS server addre Use the following DNS server 	ss automatically rver addresses:
Preferred DNS server:	
Alternate DNS server:	
	Advanced.

Gambar L.12 Konfirgurasi TCP/IP Properties Gedung B

b. Ubah Setting Access Point default

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 Ubah Settingan Access Point default untuk Gedung B menjadi settingan awal konfirgurasi, dengan melakukan log-in pada web-browser, lalu masukan IP address (Default AP : 192.168.1.1) pada address bar di web-browser lalu tekan enter.



Gambar L.13 Log-in Web-Browser Access Point Default

2. Pada tampilan awal akan muncul Status Access Point default.

TL-WR841N - Microsoft	Internet Explorer			
File Edit View Favorites	Taols Help			
Q O .	a 🏠 🔎 Search 🥎	🖢 Fanotas 🙆 🙆 - 🌄 📓	1.3	
Address 1 Net-1/1942 168 1.1/				v 🖸 🗠
	IEEE 002-11n	(Draft 2.0) Georgiant Wireless Router with	2x2 MIMO and XSI	PAN*
300M Wireless N Router Model No. TL-WR841N/TL-WR841ND	Status		î	Status Help The Status page displays the Router's
a Clatve:	Firmware Version:	3.9.7 Build 090821 Rel 58159n		only
Outlich Settings OSS	Hardware Version.	WR841N v5 0000000		LAN - The following parameters apply to to port of the Router. You can configure them
· Vite stept	LAN			Network > LAN page.
OHCP	MAC Address	00.27-19-52-10-56		MAC Address - The physical add
Security	IP Address:	192.168.1.1		 IP Address - The LAN IP address
Parential Centrol Access Control Static Routing	Subnet Mask:	265 265 265 0		Houter. • Subnet Mask - The subnet associated with LAN IP address.
Bassiwidth Control	Wireless			Windows . These are the current setting
 Dynamic Dies 	Wreless Radio:	Enable		information for Wheless You can configur
 System Teels 	Nome (SSID):	Cube_Network		and the second s
	Channet	11		 Wroless Radio - Indicates whet wroless radio feature of the Ro
	Mode:	11bgn miked		enabled or disabled.
	Channel Width:	Automatic		Channel - The current wireless of
	Max Tx Flate:	300Mbps		in use
	MAC Address:	00-27-19-62-10-56		Bie Router works on
Done				Internet

Gambar L.14 Status Access Point Default

3. Setelah muncul tampilan awal *access point*, klik menu setup maka akan muncul menu *password* dan *username default access point* yaitu:

Username	: admin	
Password	: admin	
Connect to 192	2.168.1.1	? 🔀
TP-LINK Wireless	N Router WR841N	
Password:	admin	L
	Remember my pas	sword
	ОК	Cancel

Gambar L.15 Login Default Access Point

4. Pada tampilan setup masukan *ip address* yang telah direncanakan untuk Gedung A setelah itu tekan *apply setting*.

IP Address	: 192.168.1.3

File Edit View Favorites	Tools Help		
😋 tack • 🕥 · 💌	🗿 👩 🔎 Search 📩	Favortes 🙆 🙆 🖓 🗑 • 📴 🎇 🤹	
Address () http://192.168.1.20	N/SC/		¥ 🖸
TP-LINK The Reliable Choice	IEEE 802.11n (Varit 2.0) Sempliant Wireless Router with 2x2 MIMO and	IXSPAN*
300M Wireless N Router Model No.: Tu-WR641N/Tu-WR641ND	WAN		WAN Help WAN Connection Type:
• Status • Guick Setup	WAN Connection Type:	Stelic IP M Detect	If your ISP is running a DHCP server Dynamic IP option.
OSS Network LAN	IP Address: Subnet Mask:	192.168.1.3	If your ISP provides a static or fixed I Subnet Mask, Gateway and DNS set the Static IP option.
WAN MAC Close Wreless	Default Gateway:	0.0.0.0 (Optional)	If your ISP provides a PPPoE connec PPPoE option.
• CHCP • Forwarding • Security	MTU Size (in bytes);	1500 (The default is 1500, do not change unless necessar	If your ISP provides BigPond Cable Beat Signal) connection, please sele Cable option.
Access Control State Regime	Primary DNS: Secondary DNS:	0.0.0.0 (Optional) 0.0.0.0 (Optional)	if your ISP provides L2TP connecti selectL2TP option.
A Descheidth Control			

Gambar L.16 Setting IP Address Access Point Gedung B

5. Setelah merubah ip address deafult dan subnet mask default access point menjadi ip address dan subnet mask yang sudah direncanakan untuk Gedung A, tekan menu wireless untuk merubah Network mode, SSID dan channel yang sudah ditentukan untuk gedung server itu tekan apply settings.

SSID	: Gedung B
Channel	: 9-40 MHz
Network mode	: 11 bgn mixed

TL-WR841N - Microsoft	Internet Explorer		
File Edit Vew Favorites	Tools Help		
3 tect - 3 . 1	🗟 🚮 🔎 Search 🤞	revortes 😧 🔗 🐁 🔟 • 🛄 🗱 🚳	
Address 1 http://192.168.1.20	NSCI		w 🛃 🗠
TP-LINK The Reliable Choice	IEEE 802.11n	(Draft 2.0) Compliant Wireless Router with 2x2 MIMO an	nd XSPAN [®]
300M Wireless N Router Model No. TL-WR841N/TL-WR841ND	Wireless Setti	ings	Wireless Settings Help Note: The operating distance or range
Status Oracle Setup Oracle Setup Oracle Setup Oracle Setup Oracle Setup Oracle Setup Werless Settings Wireless Settings Wireless Advanced Wireless Advanced Wireless Advanced Office Offi	SSD: Region: Warning: Charnet: Mode: Charnet/Width: Mac: Tx Rote:	Gedung B Indonesia Ensure you select a current country to confurm local taxe Incorrect selection and country in confurm local taxe II w II bogo mixed Wellers 300Mobps © Enable SSD Broadcast Enable MD	wheles connection varies signification on the physical placement of the Neu- best result, place your Roate: Neur the center of the area in whi wheles stations will operate. In an elevated location such as stat. Away from the control ocation elefences, such as PCs, micro and confess phones. With the Actiona in the updgt po . Away from large metal surfaces. Note: Failure to follow these guidelin result in significant performance deguided insulting the whereas in the norther to the Rode SSD - Enter a value of up to 32, characte

Gambar L.17 Wireless SSID dan Channel

6. Bila ingin merubah *username* dan *password*, klik menu *System Tools* dan masukan *username* dan *password* baru yang diinginkan lalu tekan *apply setting*.

TL-WR841N - Microsoft	Internet Explorer		
File Edit View Favorites	Tools Help		
G Back • 🕥 • 💌	🗟 🏠 🔎 Search 👷	Favorites 😧 🍰 🗟 • 🧾 🛍	3
Address http://192.160.1.2/			v 🗗
	IEEE 802.11n (D	all 2.0) Compliant Wreless Router with	2x2 MIMO and XSPAN*
300M Wireless N Router Model No.: TL-WR641N/TL-WR641ND	Password		Password Help It is strongly recommended that you
Status Ouick Setup Oss Network Wrotess	Old User Name: Old Password:	edmin	Note: The new user name and passw Route: All users who the hackes it web-based unity will be prompted for t user name and password. Note: The new user name and pass not exceed 14 characters in length an
OHCP Forwarding Security Parential Control Access Control Static Routing	New User Name; New Password; Confirm New Password;	Colo	include any spaces. Enter the new twice to confirm it. Click the Save button when finished Click the Clear Allociton to clear all.
Handwith Centrol P & MAC Binding Dynamic DNS System Tools Time Settings Diagnostic		Save Clear Al	_

Gambar L.18 Settingan Username dan Password Access Point

4. Uji Koneksi

Untuk dapat melihat apakah jaringan *Wireless Bridge* yang telah di konfirgurasi berhasil atau tidak, maka akan diadakan uji koneksi. Ada beberapa uji koneksi yang akan di jalankan yaitu:

1. Uji koneksi dari komputer *server* yang ada pada Gedung A dengan *access point* yang ada pada gedung A, dengan melakukan ping *IP Address access point* gedung A yaitu : 192.168.1.2



Gambar L.19 Uji koneksi antara komputer server ke access point Gedung A.

2. Uji koneksi dari komputer *client* yang ada Pada gedung B dengan *access point* yang ada pada gedung B, dengan melalukan ping *IP Address access point* Gedung B yaitu : 192.168.1.3

C:\\	WINDOWS\system32\cmd.exe	>
pter	Connection-specific DNS Suffix .: Description	•k Ada
C:∖>pi Pingin	ing 192.168.1.3 ng 195.128.1.3 with 32 bytes of data:	
Reply Reply Reply Reply Reply	From 192.168.1.3: bytes=32 time=1ms ITL=64 from 192.168.1.3: bytes=32 time=1ms ITL=64 from 192.168.1.3: bytes=32 time=1ms ITL=64 from 192.168.1.3: bytes=32 time=1ms ITL=64	
Ping s Pa Approx Mi	statistics for 192.168.1.3: ackets: Sent = 4, Received = 4, Lost = 0 (0% loss), «imate round trip times in milli-seconds: inimum = Ims. Maximum = Ims, Average = Ims	
C:>>		1

Gambar L.20 Uji koneksi antara komputer *client* Gedung B ke *access point* Gedung B.

 Uji koneksi dari komputer *client* yang ada pada Gedung B dengan *access point* yang ada pada Gedung A, dengan melakukan ping IP *Address access point* Gedung A yaitu: 192.168.1.2

🗪 C:\W	/INDOWS\system32\cmd.exe	- 🗆 🗙
pter	Connection-specific DNS Suffix : Description Atheros AR5005G Wireless Netw Physical Address	ork Ada
C:\>pin	ng 192.168.1.2	
Pinging	g 192.168.1.2 with 32 bytes of data:	
Reply f Reply f Reply f Reply f	from 192.168.1.2: bytes=32 time=4ms TTL=64 from 192.168.1.2: bytes=32 time=2ms TTL=64 from 192.168.1.2: bytes=32 time=7ms TTL=64 from 192.168.1.2: bytes=32 time=52ms TTL=64	
Ping st Pac Approxi Min	tatistics for 192.168.1.2: ckets: Sent = 4, Keceıved = 4, Lost = 0 (0% loss), inate round trip times in milli-seconds: nimum = 2ms, Maximum = 52ms, Average = 16ms	
C:\>		-

Gambar L.21 Uji koneksi antara komputer client Gedung B ke access

point Gedung A.

4. Uji koneksi dari komputer *client* yang ada pada Gedung B dengan komputer *server* yang ada pada Gedung A, dengan melakukan ping *IP Address access point* Gedung A yaitu: 192.168.1.20

💌 C:\WI	INDOWS\system32\cmd.exe	- 🗆 ×
pter	Connection-specific DNS Suffix : Description Atheros AR5005G Wireless Network Physical Address	▲ Ada
C:∖>pin;	g 192.168.1.20	
Pinging	192.168.1.20 with 32 bytes of data:	
Reply fr Reply fr Reply fr Reply fr Reply fr	ron 192.168.1.2: bytes=32 time=26ns TIL=128 ron 192.168.1.2: bytes=32 time=7ns TIL=128 ron 192.168.1.2: bytes=32 time=3ns TIL=128 ron 192.168.1.2: bytes=32 time=4ms TIL=128	
Ping sta Pacl Approxim Min	atistics for 192.168.1.20: kets: Sent = 4, Received = 4, Lost = 0 (0% loss), mate round trip times in milli-seconds: inum = 3ms, Maximum = 26ms, Average = 10ms	
C:\>		-

Gambar L.22 Uji koneksi antara komputer *client* Gedung B dengan komputer *server* yang ada di Gedung A.

5. Konfirgurasi Standard Keamanan Access Point

Dalam otentifikasi standar keamanan dalam jaringan *Wireless Bridge* ini adalah mengkonfirgurasi keamanan dengan WPA Personal, untuk otentifikasi keamanan yang besar dapat menggunakan konfirgurasi Radius yang harus dikendalikan oleh *server* khusus. Berikut adalah konfirgurasi standar keamanan pada Access Point *TP-LINK TL-WR841ND* :

1. WPA Personal

Untuk mengkonfirgurasi otentifikasi dan *enkripsi*, klik menu *wireless* lalu klik menu *Wireless Security*.



Gambar L.23 Tampilan *Default* keamanan pada TP-LINK TL-WR841ND.

Tampilan pertama pada menu *wireless security*, pada security mode menunjukan *default* keamanan pada *access point* adalah *disable*, untuk merubah keamanan pada *access point* pilih WPA personal pada *pop-up menu* yang berada pada *security* mode, setelah itu masukan *WPA shared key* di tempat yang tersedia setelah itu klik *apply settings*.



Gambar L.24Tampilan keamanan pada TP-LINK TL-WR841ND menggunakan WPA Personal

2. Mac Filtering

Untuk dapat memfilter Mac Address yang di izinkan untuk dapat mengakses jaringan *wireless*, klik MAC Filter pada *Wireless Menu*, lalu pilih enable pada pilihan use filter, setelah itu pilih *allow the stations not specified by any enabled entries in the list to access* pada menu *FilteringRules*. Lalu klik *Add New*.



Gambar L.25 Konfirgurasi keamanan Mac Filtering.

3. Trouble shooting AP Jaringan Wireless Bridge

Dalam kinerja jaringan *Wireless Bridge* memungkinkan terjadi *trouble shooting* seperti terjadinya *Crash* pada AP, adapun penanganan masalah ini adalah melakukan *Reset* pada AP, cara ini adalah cara termudah yang hanya melakukan konfirgurasi kembali AP dan tidak mengganggu koneksi *wireless* lainnya. Dalam melakukan *Reset* AP TP-LINK TL-WR841ND hanya menekan tombol reset yang ada berada di bagian belakang *access point*.